

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

OCT 2 - 1919

PERIMENT STATION FILE

1
A984F
Cop. 3

DESTROY THE COMMON BARBERRY

E. C. STAKMAN

Pathologist and Agent, Office of Cereal Investigations, formerly in
Charge of the Barberry-Eradication Campaign



The Proper Way to Remove Barberry Bushes. Dig Deep Enough to Get All the Roots

FARMERS' BULLETIN 1058

UNITED STATES DEPARTMENT OF AGRICULTURE

Contribution from the Bureau of Plant Industry
WM. A. TAYLOR, Chief

Rev. ed.
follows

Washington, D. C.

Second, revised, edition, August, 1919

Show this bulletin to a neighbor. Additional copies may be obtained free from the
Division of Publications, United States Department of Agriculture

BLACK STEM RUST of wheat and other grains destroys millions of bushels of grain every year. In the years when rust epidemics were widespread, as in 1904 and 1916, the losses ran up into hundreds of millions of dollars.

The common barberry (*Berberis vulgaris*) carries the spring stage of the black stem rust. In the northern United States the rust can not get started in the spring without the aid of the barberry.

The United States Department of Agriculture is co-operating with thirteen States in the upper Mississippi Valley in locating and eradicating all bushes of the common barberry. Nearly all of these States have laws requiring the destruction of this bush.

The common barberry should be dug and burned wherever it is found. All the roots should be taken out when digging the bush. If any are left in the ground, sprouts will come up from them. For several years the spot where a bush once stood should be watched and any new sprouts should be dug promptly.

The Japanese barberry (*Berberis thunbergii*) does not rust. It is a beautiful bush of a graceful spreading habit and may be planted wherever the common barberry is dug.

Destroy the common barberry and save the grain.

DESTROY THE COMMON BARBERRY.

CONTENTS.

	Page.		Page.
Loss caused by the barberry.....	3	Don't let the common barberry run wild.....	6
Kill the barberry now.....	3	Dig the bushes by the roots.....	7
The barberry dangerous wherever it is.....	4	The Japanese barberry harmless.....	8
The common barberry an outlaw.....	4	How to distinguish the two kinds of barberry..	9
How Denmark prevented rust epidemics.....	5	Help!.....	10
The evidence against the barberry conclusive..	5		

LOSS CAUSED BY THE BARBERRY.

EVERY COMMON BARBERRY BUSH in the grain-growing regions of the United States should be destroyed immediately. The bush is a serious danger to grainfields, because it carries and spreads the dreaded black stem rust of wheat, oats, barley, rye, and wild grasses. This disease destroys millions of bushels of grain every year. In 1916 the black rust was the principal cause which reduced the yield of wheat in Minnesota, North Dakota, South Dakota, and Montana by over 200,000,000 bushels and in Canada by 100,000,000 bushels. Careful estimates place the money loss in the United States in 1916 at nearly \$200,000,000.

The common barberry is the means of spreading this terrible scourge of grainfields. It becomes infected with the rust in the spring and the rust then spreads from the bushes either directly to grainfields or first to wild grasses and then from the grasses to the grain. Every common barberry bush must be destroyed immediately therefore in order to protect our grain crops.

KILL THE BARBERRY NOW.

Now is the time to dig barberry bushes. Increase your yield this year by reducing rust damage. The longer the bushes remain in the ground the greater the menace to grain crops. Rust usually develops on the barberries most abundantly in the spring, but may continue to develop on them throughout the growing season. The bushes, therefore, not only start the rust in the spring, but they also may continue to spread it all summer. Every barberry bush destroyed means more grain.

THE BARBERRY DANGEROUS WHEREVER IT IS.

Barberry bushes and hedges in villages and cities can damage distant grainfields. The rust is spread by the wind and can be blown long distances. City dwellers who have planted the common barberry can assist in protecting fields of wheat and preventing crop losses by removing their bushes. It has often been observed that barberry bushes in large cities spread rust, first to grasses near by and then onward to grainfields several miles distant. Execute this criminal bush wherever it is, because it often works secretly far from its victims, the grainfields and the grain growers.

THE COMMON BARBERRY AN OUTLAW.

The destruction of the common barberry bush is especially vital in the most important grain-growing districts. Its eradication is now required by law in Colorado, Illinois, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, South Dakota, and Wisconsin. Indiana, Ohio, and Wyoming are leaving no stone unturned to remove all of their harmful barberry bushes. Even in the absence of definite legal requirement, owners of the bushes, realizing the damage which they are capable of doing, are expressing their preference for good crops rather than for a bush which can be replaced by harmless and more beautiful shrubs.

To prevent the shipment of harmful barberries and mahonias into States where the eradication campaign is in progress, the United States Department of Agriculture established a quarantine, effective on and after May 1, 1919. This quarantine prohibits the shipment of several species and varieties¹ from any State outside the eradication area into any of the States within that area—Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming.

For hundreds of years practical farmers have known that the common barberry develops black stem rust, and for fifty years scientists have known how it does this. Even as early as 1660, local laws were passed against the barberry in France. Many laws designed to eradicate the barberry were enacted in European countries, and several American Colonies passed similar laws about 1750. A barberry-eradication law has been on the statute books of Ontario for several years. Denmark eradicated the barberry and prevented the black stem rust. The relation between barberry and rust, then, is a long-established and

¹ The following species and varieties are covered by this quarantine: *Berberis aethensis*, *B. altaica*, *B. amurensis*, *B. aristata*, *B. asiatica*, *B. atropurpurea*, *B. brachybotrys*, *B. brevipaniculata*, *B. buxifolia*, *B. canadensis*, *B. caroliniana* (*carolina*), *B. coriaria*, *B. cretica*, *B. declinata*, *B. fendleri*, *B. fischeri*, *B. fremontii*, *B. heteropoda*, *B. ilicifolia*, *B. integerrima*, *B. laziflora*, *B. lycium*, *B. macrophylla*, *B. nepalensis*, *B. neuberti*, *B. sibirica*, *B. sieboldii*, *B. sinensis*, *B. trifoliolata*, *B. umbellata*, and *B. vulgaris*, including subspecies and horticultural varieties.

Mahonia aquifolium, *M. diversifolia*, *M. glauca*, and *M. repens*.

unquestioned fact, as hundreds of farmers will testify who have noticed the effect of the bushes on their grainfields.

HOW DENMARK PREVENTED RUST EPIDEMICS.

Denmark proved conclusively the value of barberry eradication, and by destroying the rust-producing species, as required by the law of 1903, stopped all serious outbreaks of black stem rust. Previous to the removal of barberry bushes there had been periodic destructive rust epidemics, but since that time there has not been a single serious outbreak in Denmark. In the United States, however, during the same period there have been two terrific epidemics causing enormous losses, the last one occurring in 1916, when every bushel of grain was vitally important. Not a year passes in which the black stem rust does not destroy several millions of bushels of wheat and other grains.

THE EVIDENCE AGAINST THE BARBERRY CONCLUSIVE.

The guilt of the common barberry has long been established beyond any doubt. It gives the rust its start in the spring. Without the barberry the rust is practically powerless to spread to grains and grasses. The reason for this is that there are three different stages of rust during the year. The black-spore stage, or winter stage, of the rust lives during the winter on grain stubble and wild grasses. It can not spread directly to grains or grasses, but must spread first to the common barberry to get its start in the spring.

The black rust spots on stubble and straw consist of large numbers of minute black spores (seeds). These spores germinate early in the spring, producing smaller spores which are blown about by the wind. These smaller spores are entirely harmless unless they fall on barberry leaves, because they can not start rust on grain. When they fall on barberries, however, they cause the spring stage, or cluster-cup stage, of the rust on the leaves and other tender parts of the bushes. The cluster cups are filled with immense numbers of spring or cluster-cup spores. These spores can not spread rust from one barberry bush to another, but are blown to grains and grasses and cause the red-spore stage, or summer stage, of the rust. Within a week or ten days from the time when they fall on the grain or grass plants the red rust appears.

The red or summer stage of stem rust is familiar to most farmers as the long reddish brown spots on various parts of the grain plants. The red spots (pustules) are composed of enormous numbers of the red or summer spores of the black rust. These spores are in turn blown about by the wind and infect other near-by grains and grasses. In this way a new crop of the red spores is produced every week or ten days during the growing season if conditions are favorable for the spread of the rust. Late in the season the red stage is replaced by the black or

winter stage, and the rust overwinters again in this form on stubble, straw, and grasses. The next spring it again has to depend upon the barberry to get started. The removal of the common barberry, there-

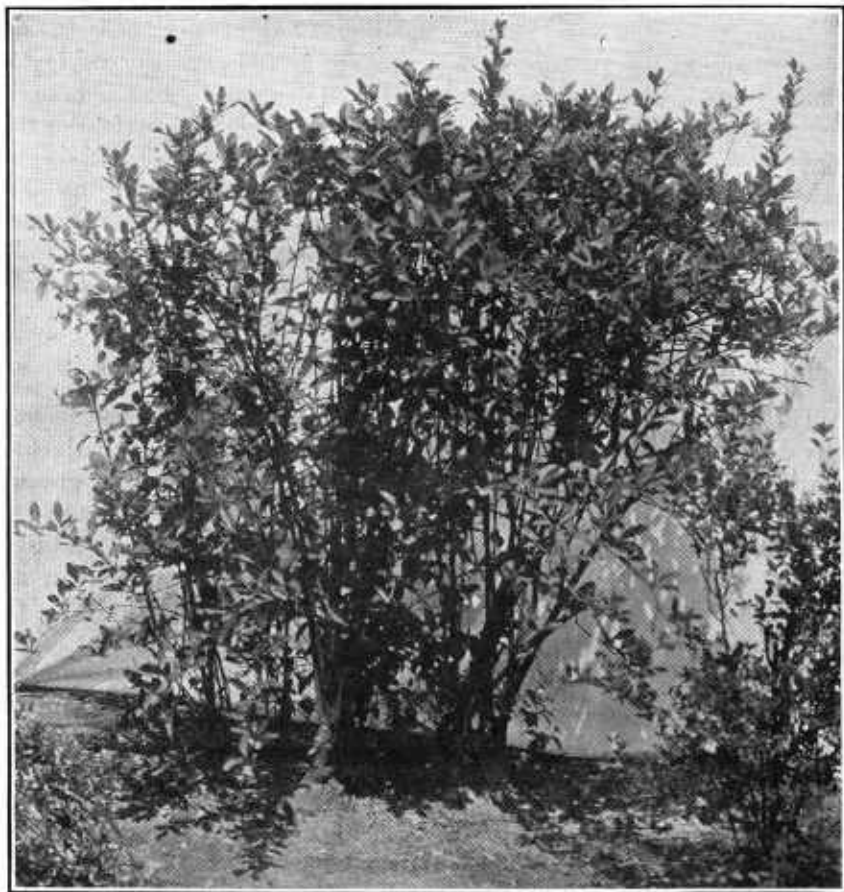


FIG. 1.—A bush of the common barberry, showing its erect growth and comparatively large leaves.

fore, deprives the rust of its principal ally and checks its spread. Every time a barberry bush is removed one of the props is knocked out from under the rust.

DON'T LET THE COMMON BARBERRY RUN WILD.

The common barberry is beginning to run wild. It has been planted widely as an ornamental shrub in cities, villages, and rural districts. It was distributed all over the country by nurserymen before it was realized how destructive it is. Since the nurserymen have learned about the effects of the bush, they have taken the lead not only in destroying their own bushes but in assisting in the destruction of

others. Patriotic nurserymen of Minnesota destroyed over 598,000 barberry bushes in the spring of 1918, representing a great financial loss. One nurseryman in Iowa destroyed 50,000 valuable purple-leaved bushes, and practically all nurserymen have stopped propagating any harmful kinds of barberry.

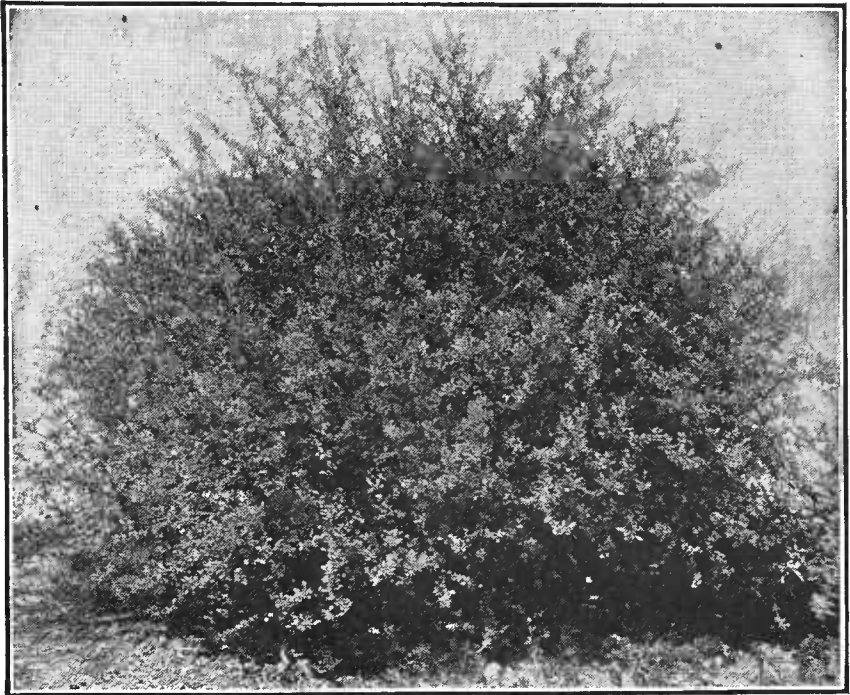


FIG. 2.—A clump of Japanese barberry, showing the lower and more spreading habit of this beautiful shrub.

Unfortunately, the common barberry has begun to run wild in the grain-growing districts. It has commenced to establish itself along streams, in pastures, and along roadsides, where it is in a position to do its deadly work at close range. If this spread is not checked at once, we shall probably be growing barberries and black stem rust but very little wheat within comparatively few years. Dig the barberry now, thus protecting the present grain crops and insuring those of the future.

DIG THE BUSHES BY THE ROOTS.

Dig out the bushes completely. Eradication means complete removal. When digging the bushes, be sure to get all of the roots. If pieces of the roots are left in the ground, young sprouts may grow from them. These sprouts are especially susceptible to rust.

Watch for several years the places from which the bushes have been removed and destroy any sprouts which may appear. The eradication must be complete and thorough or the barberry problem will

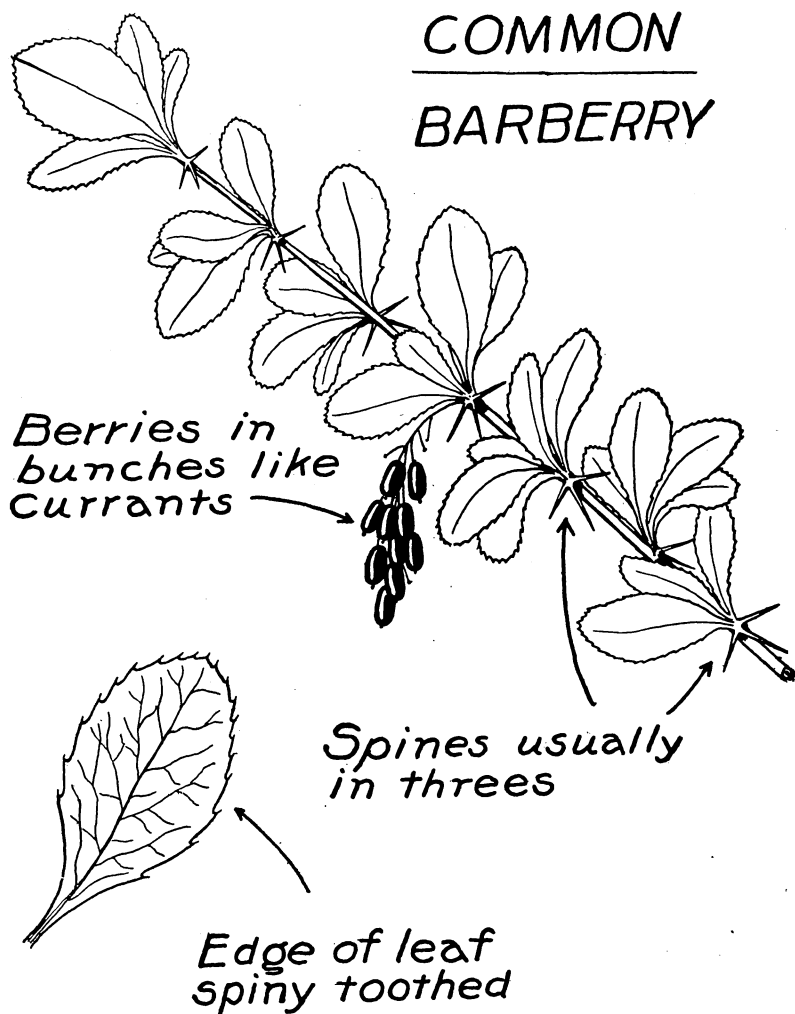


FIG. 3.—A twig of common barberry, showing the larger leaves with toothed edges, the spines on the stems usually in threes, and the red berries in long drooping bunches, like currants. (Compare with the Japanese barberry, fig. 4.)

again arise within a few years. A thorough job now means protection for the future (see the title-page illustration).

THE JAPANESE BARBERRY HARMLESS.

The Japanese or dwarf barberry (*Berberis thunbergii*) does not rust. It is entirely harmless and should not be disturbed. This is very fortunate, because it is a beautiful bush which can be used to replace the common barberry to a considerable extent.

HOW TO DISTINGUISH THE TWO KINDS OF BARBERRY.

The harmful common barberry (*Berberis vulgaris*) can easily be distinguished from the harmless Japanese barberry by comparing figures 1, 2, 3, and 4. It is a tall, erect, spiny shrub, often as much as 10 to 12 feet high (fig. 1). The most striking differences besides

JAPANESE BARBERRY

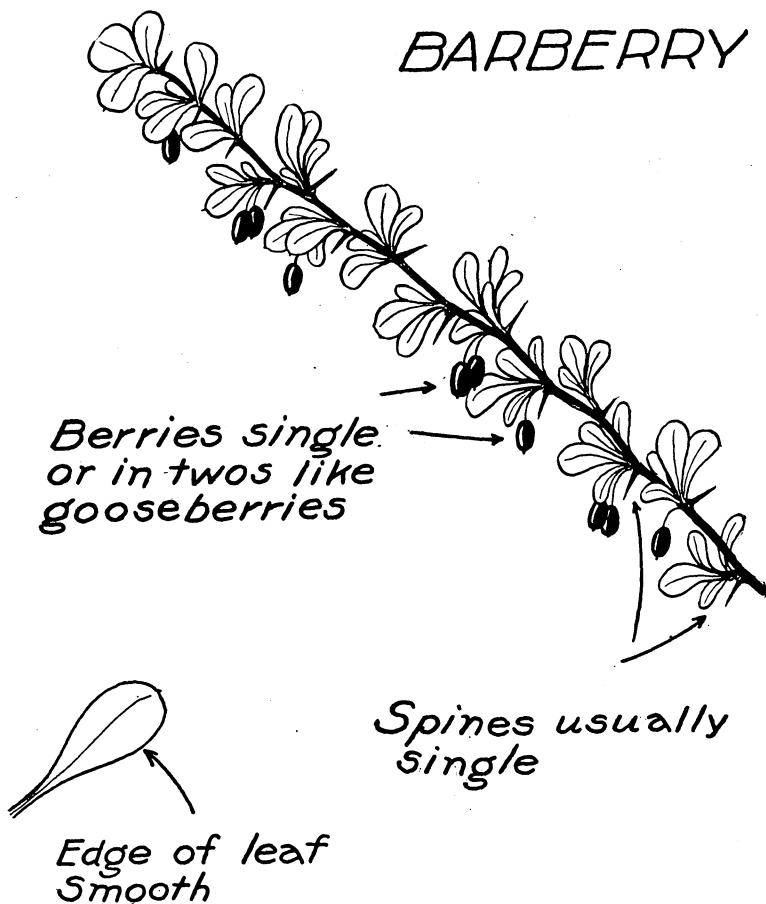


FIG. 4.—A twig of Japanese barberry, showing its smaller leaves with no teeth on the edges, the spines on the stem usually one or sometimes two in a place, and the red berries singly or in small and short clusters of two, like gooseberries. (Compare with the common barberry, fig. 3.)

the height are shown in figure 3. The leaves are green or purple in color and have saw-toothed edges. The spines are usually in groups of three or more. The yellow flowers are small and seldom noticed, but the red berries, which are borne in long clusters, like currants, are quite conspicuous. The bark is grayish. The purple barberry is only one variety of the common form and rusts just as badly as the

green-leaved bush. Several other species and varieties of barberry also carry rust. Those which resemble the common barberry in appearance should be destroyed.

The harmless Japanese barberry is a beautiful, low, spreading bush (fig. 2). It is smaller than the common barberry, being usually 2 or 3 feet tall and seldom more than 4 or 5 feet. The differences

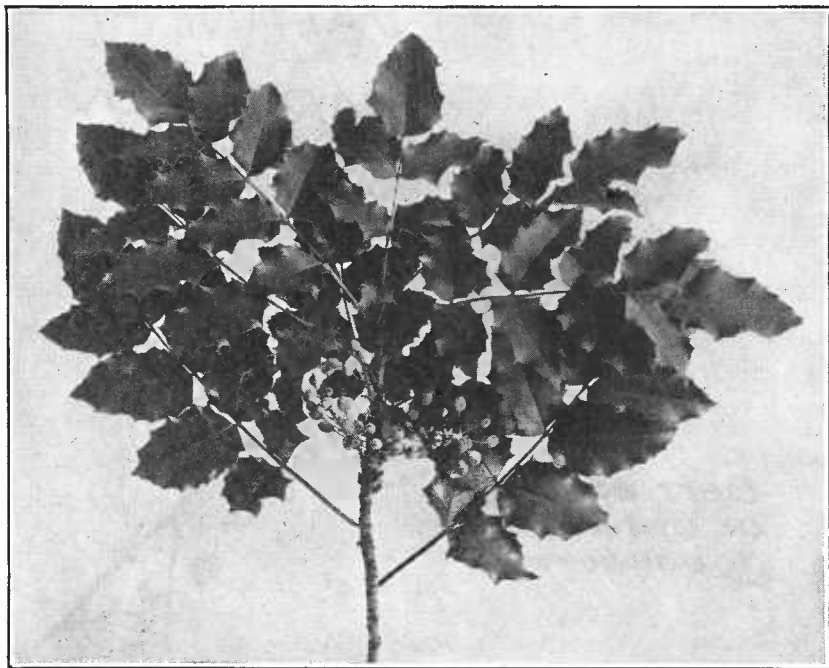


FIG. 5.—A twig and fruit of *Mahonia* (*Berberis*) *aquifolium*, often but not properly called "Oregon grape." (About one-third natural size.)

in leaves, spines, and berries are shown in figure 4. The leaves are small and have smooth edges. The spines usually are single, although sometimes there are two or even three in a place. The flowers are small and yellowish in color. The red berries are borne singly or in small clusters of two or three, like gooseberries. The bark of the Japanese form usually is reddish in color.

The mahonia, or Oregon grape, as it is improperly called (figs. 5 and 6), is closely related to the barberry. It also may rust and should be destroyed. This bush has compound, hollylike leaves, which often are spine pointed. The berries are bluish. It is found wild from the Rocky Mountains westward and is cultivated somewhat in the eastern United States.

HELP!

If you saw an anarchist with a blazing torch in his hand sneaking through the grass to your ripe wheat field, intending to set it on fire, what would you do? If you saw several of his companions in crime

sneaking to your granary with oil and matches, what would you do? If you saw a mob of wild-eyed anarchists running amuck with fire-brands and destructive intent, what would you do? You would shoot the first, you would shoot as many of the small group as you could, and you would call for help to exterminate the whole breed.

The common barberry is a red-handed anarchist bush. It has a long career of crime behind it. It has a longer and more terrible career of crime before it if we don't put a stop to it. It has destroyed billions of bushels of wheat and other grains in the past. It will destroy billions of bushels in the future unless we destroy it. Den-



FIG. 6.—Compound leaf and fruit of *Mahonia (Berberis) aquifolium*, often but not properly called "Oregon grape." (About two-thirds natural size.)

mark destroyed the common barberry and stopped the stem rust. Many farmers in this country have destroyed their own bushes and rescued their crops from ruin by the rust.

The United States Department of Agriculture and the grain-growing States are eradicating the common barberry. Are you for it or against it? We can not save the wheat and keep the barberry. The wheat is valuable and needed; give it a chance! The common barberry is not valuable and can be replaced by the beautiful Japanese barberry.

DESTROY THE COMMON BARBERRY!

LIFE STORY OF THE BLACK STEM RUST OF WHEAT AND OTHER GRAINS

SPRING: Rust develops on the barberry in the spring

SUMMER: The red stage spreads on grains and grasses

AUTUMN: The black stage follows the red stage

WINTER: The black stage winters on stubble and grasses. Goes only to barberry

The common barberry carries and spreads black stem rust of wheat, oats, barley, and rye

The Japanese barberry is harmless

***Destroy
The Common Barberry***



PUBLICATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE RELATING TO GRAIN RUSTS.

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

The Black Stem Rust and the Barberry. (Yearbook Separate 796.)

**FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE,
WASHINGTON, D. C.**

Investigations of Rusts. (Bureau of Plant Industry Bulletin 63.) Price, 10 cents.

The Rusts of Grains in the United States. (Bureau of Plant Industry Bulletin 216.)

Price, 15 cents.

Lessons from the Grain-Rust Epidemic of 1904. (Farmers' Bulletin 219.) Price,

5 cents.

DESTROY THE COMMON BARBERRY

**It Spreads
THE BLACK STEM RUST
of Wheat and Other
Grains**



**For further information write to your
STATE COLLEGE OF AGRICULTURE
or the
U. S. DEPARTMENT OF AGRICULTURE**